Mortar Value Engineering Team (MOVE)

Chartered and Sponsored by PM-Mortars

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OUTLINE

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OBJECTIVES

- Provide Value Engineering (VE) Solutions of Armaments Design, Material and Process-related Problems for our customer.

- Utilize DOD-Instructed VE Techniques.
- Stay Focused on Customer Needs/problems For a Greater Return on Investment (ROI).
- Provide Cross-functional Expertise For "One-stop Shopping" Solution to Soldier's Problem
- Inspire and Support other teams to provide "World-Class" Products and Services.

BACKGROUND

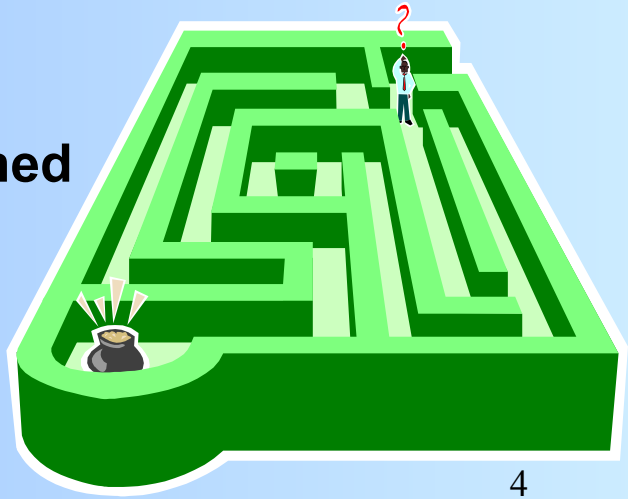
- ➔ Formed a Mortar Value Engineering (MOVE) Team of Cross-Functional Experts With Motivation to Excel in applying
  "State-of-the Art VE Tools and Techniques."

- ➔ Vision: MOVE Team Will Be Known As "The VE Provider of Choice."

- ➔ Mission: Provide Customer-focused Value Engineering Solutions.

- ➔ Function: Initiate, Facilitate and Execute VE Programs For Mortar Systems

- ➔ Excellence Support: MOVE team has championed
- ➔ "VE Excellence" at TACOM-ARDEC with 100% commitment from our Customer.

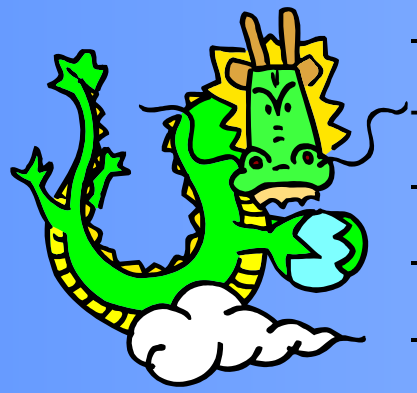


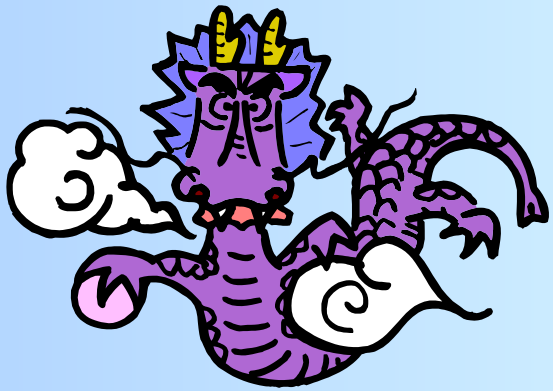
WHAT IS VALUE ENGINEERING?

- An organized effort to analyze the functions of products & services to achieve lowest life-cycle cost while satisfying design, producibility, functional requirements & customer needs

POOR VALUE INDICATORS

- **The following may be indicators of poor value:**
  - **Not using feedback from tests and field performance**
  - **Infrequent or insufficient design effort and review**
  - **Unused advances in technology**
  - **Not soliciting feedback**
  - **Excessive cost of material**
  - **Specification review**
  - **User complaints**
  - **High demilitarization cost**
  - **Excessive maintenance and repair costs**
  - **Difficulty of adaptation (not user friendly to soldier)**
  - **Shortages and high consumption rates (excessive rework, scraps)**





VE APPROACH

⇒Identify/Validate Improvement(s)

⇒Explore Options

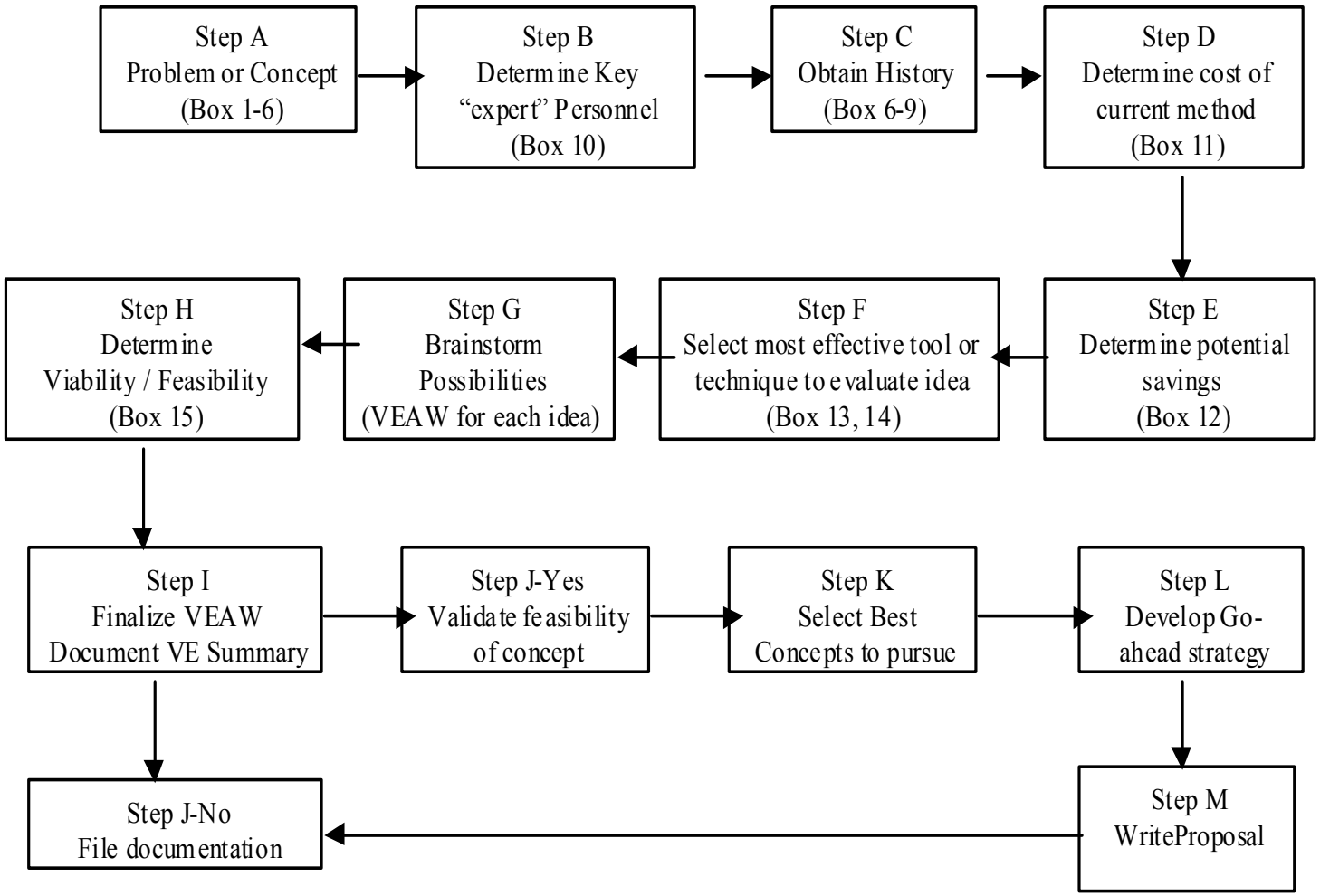
⇒Develop Strategy

⇒Test/Evaluate

⇒Implement Change(s)

$ REAP BENEFITS $

Value Engineering Analysis Flowchart



HOW CAN OUR STAKEHOLDERS PARTICIPATE IN VE PROCESS?

- Value Engineering Change Proposal (VECP): Contractor Generated
- Value Engineering Proposal (VEP): Government Generated

*By continuous excellence/improvement in

-Materials: Innovations

-Processes: Automations

-Equipment & Tooling: using advanced practices

-Quality: Reduced inspection levels by building quality into products& processes; scrap & rework reduction

-Operations: Superior work flow layouts with no bottlenecks

-Reduced inventory levels, material handling & storage of raw materials, work-in-process & finished products

- A WIN-WIN situation for the Contractor & the Government

ACCOMPLISHMENTS

Tritium Containment Bag

- **Current:** NRC states current bag is inadequate
- **Proposed:** Bag fielded to trial units for evaluation

Validated Cost Avoidance of $700k

Improved Ignition Cartridge

- **Current:** Ignition cartridge uses RTV silicone seal
- **Proposed:** Use mechanical crimp seal+RTV

Estimated Cost Avoidance $500k over next 7 years

Improved Increment Protector

- Develop Improved Increment Protector To Replace Existing Two-Piece Design. Minimize Interior Layer Of Foam and Taping Operation.
- Estimated Savings Projected to be $2.25 per cartridge for a total of $583k.

Recycle Plastic Components

Recycling increment protector by collecting parts and selling the reground plastic is not cost effective because of the quantity.

Typical program has 1000 components at proving ground per year and ground plastic sells for $0.10 per part. Only way to make it cost effective is to increase the quantity

MOVE Mortar Value Engineering Team
- Customer Focused
- Value Added Solutions

ACCOMPLISHMENTS

Reduce number of M734A1 fuzes required for LAT

M734A1 fuzes are fired on a 60mm, 81mm, and 120mm for LAT. Since the quality of the products being delivered from the contractor has an excellent track record, the number of fuzes (thus rounds) can be reduced.

Validated Savings of $177k (FY03) and Cost Avoidance of $405k (FY04-05)

Recycle Shipping Containers

Send Back M548 containers to the producer after component is sent to LAP facility and unpacked.

Estimated Cost savings w/ Fuze is $52k
Estimated Cost savings w/ignition cartridge is $145k

Use Fully Inert Fuze with Inert Rounds

Use inert M734 fuze for warmers, spotters, and calibration

Validated Cost savings is $1,112k and cost avoidance is $783k.

Utilize Old Hardware for Testing

Utilized existing M734 fuze hardware that had been scheduled for disposal to build new M734A1 components for the purpose of Final Hazard Classification testing.

Validated Cost savings is $1.1M.

Sample of GLOVE (Global VE) Ideas

- Eliminate wire-bound box and solid wood box as consolidator packs - use frame work
- Refurbishment logistics (PA 154)
- Eliminate foam from 60mm prop charge support
- Pest-free wood replacement box / pallet using recycled plastics leveraging Immiscible Polymer Blend (IPB) technology
- Fire out of box/bustle rack/clip
- Smart package with sensors/mobile inventory
- Green Packaging (reusable, environmentally friendly and biodegradable)
- Virtual Testing using simulation & modeling

FUTURE PLANS

- **Continue initiating VE efforts by questioning the status quo - technology is moving ahead quickly.**
- **Serve as a mentor to other VE teams and those who wish to learn about the VE process.**
- **Apply lessons learned from MOVE team accomplishments to other commodities within Mortars & to other weapon & ammunition systems. Bench Mark with the best in Industry & Govt.**
- **Present case-histories of achievements & train others at TACOM & AMC level; provide VE training to make a value-oriented cultural change throughout tri-services.**

Work-Study Exercise

Statement of Challenge

- Add night-time capability to direct lay (line of sight) weapon to existing mortar weapon.

- Currently unable to direct lay 60mm weapon during night mission. Soldier suggested using a bracket to mount an IR laser pointer.

Fast-Track Innovative Process (FTIP)

- Soldier developed concept and ARL/RI produced first three prototype brackets.
  - Item was successfully used during night fire training.
  - A Picatinny employee worked with the soldier who came up with the concept.
  - The Picatinny employee illustrated the urgent need of getting this product to the field through the engineering community.
  - He maintained communication between the soldier in the field and the designers.

FTIP (cont'd)

- Southern European Task Force Science Advisor, with an approved Operation Needs Statement, sent bracket concept to Army Research Laboratory (ARL).
- Additional prototypes were produced at RI and sent to the field for further validation by operations unit.
- Fast track team at Picatinny did laboratory analysis, finite element analysis, identified and changed a minor dimensional deficiency.
- Improved prototype brackets were made at Picatinny. These brackets will be used in validation firings at Aberdeen Proving Ground.
- There are 12 brackets deployed to Iraq.

Lessons Learned

- Avoid mindset to Design, develop and field “perfect” munitions.

vs.

- Design, validate and field quality munitions to our troops safer, better and quicker in less than 12 months.

- Develop and maintain proactive communication between troops and design community.

Potential Benefits / Risks

- 2-5 year development cycle / item is obsolete before being delivered to the troops.
- 6-12 months development cycle / design may not be optimized resulting in design variations in the field.
- Identify and overcome barriers to fast track fielding process.
- Identify entities / individuals who can deliver results for quick response and support.

Summary

- Facilitate, Mentor and Support IPTs to achieve their VE Goals.
- Potential cost savings to date is over $5.56M with ROI of 384%.
- Reduce cost through optimization of:
  - products, materials, technologies, processes, procurement and superior Materiel Requirement Planning and inventory control.
- Continue to provide Innovative Solutions to our soldiers using Functions Analysis Systems Technique and Work-Studies.
- **NET RESULT:** VALUE ADDED productivity enhancements for WORLD CLASS guns & bullets for our soldiers!

Team List

- Vic Khanna - Team Leader
- Ray Trohanowsky - Team Facilitator
- Bob Haugeto - Fire Control Division
- Chris Dzury - Packaging Division
- Ryan Johnson - Munitions ILS Div
- Pete Mullaney - Producibility
- Sunny Pham - Fuze Division
- Ken Milano - Packaging Division
- Chirag Trivedi - Quality
- Brian Torppey - Packaging Division